

CLAIMS

1. A fluorescence image device comprising first means for containing constituents to be analyzed, second means for illuminating with polarized light the constituents to be analyzed and third means for reading
5 out a fluorescence light emitted by the constituents under the action of the polarized light, characterized in that the first means consist of a parallel microchannel structure (4) and in that the second means
10 comprise at least one coupling device (2, 5) for guiding polarized light into the microchannels.

2. The device according to claim 1, characterized in that the microchannels are etched in a glass or high optical quality plastic or silicon support chip.
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3. The device according to claim 1, characterized in that the microchannels are flexible capillaries.

4. The device according to any of the preceding
20 claims, characterized in that the coupling device comprises a diffraction grating (5).

5. The device according to any of claims 1 to 3, characterized in that the coupling device comprises a
25 cylindrical lens (2).

6. The device according to claim 1, characterized in that the second means comprise a laser or a microlaser for illuminating the whole of the
30 microchannel structure (4) and in that the third means comprise a first polarizing filter (6, 11, 13) for

filtering, firstly, a first component of the polarized fluorescence light according to a first direction and a second polarizing filter (7, 12, 14) for filtering, secondly, a second component of the polarized
5 fluorescence light according to a direction perpendicular to the first direction.

7. The device according to claim 6, characterized in that it comprises a filter wheel (9, 15) for
10 switching the first filter (6, 11, 13) and the second filter (7, 12, 14).

8. The device according to any of claims 1, characterized in that the second means comprise a laser or microlaser for illuminating the whole of the microchannel structure (4) and in that the third means
15 comprise a birefringent crystal (16, 17) for separating the fluorescence light emitted according to two components polarized perpendicularly to each other.

9. The device according to claim 6, characterized in that the laser or microlaser emits at a wavelength (λ_1) substantially between 488 nm and 514 nm or at a wavelength (λ_2) substantially between 550 nm and
20 580 nm.

10. The device according to claim 1, characterized in that the second means comprise a first laser or microlaser for illuminating a first area of the microchannel structure (4) and a second microlaser for
30 simultaneously illuminating a second area of the microchannel structure (4) and in that the third means comprise a birefringent crystal (16, 17) for separating

the fluorescence light emitted according to two components polarized perpendicularly to each other.

11. The device according to claim 10,
5 characterized in that the first laser or microlaser emits at a wavelength (λ_1) substantially between 488 nm and 514 nm and the second microlaser emits at a wavelength (λ_2) substantially between 530 nm and 550 nm.

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12. The device according to any of claims 8 or 10,
characterized in that the birefringent crystal is a LiNbO_3 crystal or a calcite crystal.

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